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RESOURCE MANAGEMENT REPORT

ONTARIO

DEPARTMENT OF LANDS AND FORESTS

Hon. A. Kelso Roberts, Q.C.
Minister

F.A. MacDougall
Deputy Minister

(These Reports are for Intra-Departmental Information
and Not for Publication)

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No. 70 July, 1963

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(THESE REPORTS ARE FOR INTRA-DEPARTMENTAL INFORMATION AND NOT FOR PUBLICATION)

THE PRESENT STATUS OF SHARP-TAILED GROUSE IN KENORA DISTRICT, 1962

by
R. W. McGillivray,
Conservation Officer

Abstract

As a special project, a survey of the locations, numbers and dancing grounds of Sharp-tailed Grouse (Pedioecetes phasianellus) was carried out in the Dryden area during 1962. Ten locations indicated by Olson (1959) were visited and 16 new locations were found. A total of 81 birds was observed on 17 of the 26 locations visited, with the flocks ranging in size from one to twelve birds. One dancing ground and one nesting site was found. Breeding took place during the early part of April with a low survival rate for young birds. As the existing population appears to be remaining relatively constant it is suggested that this would be an ideal situation in which to exercise some constructive management.

Introduction

Up until the year 1959 little or no work was done on the Sharp-tailed Grouse (Pedioecetes phasianellus) in the Kenora District. At that time a request was made by Mr. H. Lumsden of the Fish & Wildlife Branch, that all known locations of this species be recorded along with locations of dancing grounds, and the number of birds in each flock.

This work was carried out by A. R. Olson (now Fisheries Management Officer-Kenora District) in the Dryden area which contains almost all the existing population of these birds in Kenora District. Olson began a survey in February of 1959 and terminated his work with a report of that year.

The study was not continued in the following years of 1960 and 1961 and it was not until 1962 that the writer chose to continue the work as an extra project.

Work was initiated in March, 1962 and was continued over the following eight months with the exception of June, July and August, when no observations were made. Reference was made to

Olson's report (1959) and the sites located by him were investigated first. Some of these sites. could not be visited during the spring as the access roads were impassible at that time. However, all sites were visited during the fall investigations and birds were only observed on one site.

Methods of Censusing

1. Early morning and evening auto patrols were made along Township and Company roads. These patrols were at first directed to sites located by Olson (1959). When birds could not be located on these sites, residents adjacent to the sites were contacted in an attempt to locate the flock. It was found that by contacting these people valuable information could be gained not only regarding the whereabouts of the flock, but also information on the history of the flock and possibly the location of other flocks.

When a flock was located, the following data were recorded:

(1) Location - as to Township, Lot and Concession numbers
(2) Description of the area including cover type
(3) Number of birds observed
(4) The activities of the birds

2. The Dryden Division Staff were asked to report all observations of these birds.

3. During fall investigations of all sites, the areas were covered on foot using a dog in an attempt to flush birds from the heavier cover of grain or timothy, and alder thickets.

Observations

All observation data are contained in Table I. These are personal observations and also include some observations made by other Department employees. The map* gives all locations of birds observed by Olson, numbers 1 to 10; and all locations of birds observed by McGillivray, numbers 11 to 26.

Appendix I contains the locations in tabulated form. The first flock of Sharptails was located on March 29 on Highway # 17, Lot 1, Concession II, Mutrie Township. When first observed, the birds were on the edge of the highway and immediately flew into the nearby heavy cover. This flock was again observed the following morning dancing in a field in the same location. They

* A map showing the locations of Sharp-tailed Grouse flocks accompanied the original report now in the Fish and Wildlife Library, Maple.

carried on their activities within two hundred yards of a farm house. This flock of birds provided an excellent study group as they were present in the same area and did not move more than one-quarter of a mile away from the site.

Two other Sharptails were observed on Lot 8, Concession V, Wabigoon Township. These birds were picking up gravel on the road adjacent to the lot and were never located after this observation nor were any other birds observed in this area.

The only other Sharptail seen during the spring period was a bird located on Lot 8, Concession IV, Melgund Township. This is the location of one of the dancing grounds located by Olson (1959) who saw up to 12 birds here. This bird was only observed on the one occasion. No other birds were seen during the spring investigations and it was not until September that the number of flocks located increased from three to 13.

The first flock of Sharptails was observed on September 13. It contained five immature birds that were seen crossing Highway #17 at Lot 11, Concession IV, Melgund Township. It is possible that these birds were a product of the flock observed by Olson (1959) on Lot 8, Concession IV of this same township. For the purpose of this report it will be considered as a separate flock as will all similar sightings of flocks in adjacent areas.

Since September 13 nine other flocks were located and many other possible locations were investigated. These locations were reported by local residents who had been contacted in areas where the cover appeared suitable, but no birds had been observed by the writer during patrols. In several cases residents reported locations and numbers of birds observed in these areas. Their reports were felt to be sincere and factual, however, they are not included in this report as further investigation is required

The two flocks of Sharptails located in Revell Township, Lot 3, Concession VI and Lot 5, Concession V, are actually in Sioux Lookout District, but they will be included in this report as part of Kenora District.

TABLE I

SPRING OBSERVATIONS OF SHARPTAILS

Date	Time	No. Birds	Location	Activities
Mar. 29	7.00 A.M.	4	Lot 12, Con. 2, Sanford Township.	Birds at edge of Highway #17 picking up gravel
Apr. 1	7.00 A.M.	3	Lot 1, Con. 2, Mutrie Township.	Dancing in Cultivated field
Apr. 2	3.00 P.M.	2	Lot 8, Con. 5, Wabigoon Township.	Birds at edge of road picking up gravel
Apr. 3	7.00 A.M.	2	Lot 1, Con. 2, Mutrie Township.	Dancing in field
Apr. 4	7.00 A.M.	4	Lot 1, Con. 2, Mutrie Township.	Dancing in field
Apr. 17	6.30 A.M.	1	Lot 8, Con. 4, Melgund Township.	Standing in fallow field
Apr. 23	7.30 A.M.	3	Lot 1, Con. 2, Mutrie Township.	Standing in field

TABLE II

FALL OBSERVATIONS OF SHARPTAILS

Date	Time	No. Birds	Location (Township)	Activities
Sept. 13	8.00 A.M.	5 Juv.	Lot 11, Con. 4, Melgund	Crossing Hwy. #17
Sept. 14	6.00 A.M.	12	Lot 5, Con. 5, Revell	On stubble in cutover
Sept. 14	6.30 A.M.	1	Lot 2, Con. 5, Langton	Crossing Road
Sept. 14	6.30 A.M.	4	Lot 3, Con. 6, Revell	In cutover area
Sept. 22	1.00 P.M.	3	Lot 1, Con. 2, Mutrie	Flushed from side of Hwy. #17
Sept. 26	2.00 P.M.	3	Lot 1, Con. 2, Mutrie	Flushed from edge of alder thicket
Sept. 29	3.00 P.M.	1	Lot 1, Con. 2, Mutrie	Flushed from long grass
Oct. 12	11.00 A.M.	1	Lot 8, Con. 3, Mutrie	At edge of Highway #17
Nov. 4	4.00 P.M.	8	Lot 15, Con. 5, Aubrey	Flew off of stubble field
Nov. 8	12.30 P.M.	6	Lot 7, Con. 2, Rugby	Feeding in stubble field
Nov. 9	9.00 A.M.	1	Lot 10, Con. 4, Sanford	At edge of road
Nov. 20	4.30 P.M.	10	Lot 10, Con. 6, Hartman	At edge of road cackling
Dec. 9	10.00 A.M.	7	Lot 2, Con. 3, Eton	Feeding in stubble field

Dancing Grounds

Only one dancing grounds was located during the spring survey, - on the south half Lot 1, Concession II, Mutrie Township.

Three birds were first observed dancing here on April 1 and dancing continued until April 23, when the birds were observed in the field, but no longer danced. These dates are quite similar to those found by Olson (1959) when he observed birds first dancing on April 7 and terminating on April 17. This would indicate that the mating season in this area is from April 1 to some time near the end of the month.

The number of birds dancing on this ground increased from three to four birds during the observation period.

No other dancing grounds were located during the survey period and only one bird was observed on the dancing grounds located by Olson (1959) - (Lot 8, Concession IV, Melgund Township).

Habitat

Birds were usually sighted in cultivated or fallow farm fields which are bordered on at least one side by a strip or patch of alders and these are backed by a heavier stand of mixed timber. The timber stand is usually mixed with compositions of aspen, balsam and jackpine. In some cases the surrounding stand is pure black spruce and in this case the birds were observed in cut-over areas adjacent to large muskegs.

In all cases a stream was observed near the site where the birds were found. Notice of this fact was also made by Olson (1959).

It appears as more and more work is done that the birds are only utilizing a small portion of the available habitat. Why these birds are not present in greater numbers remains a mystery.

Breeding Success

Breeding success for some unknown reason is not high. Flocks do not appear to be increasing in numbers and are remaining fairly constant. When a flock is reduced by hunting or some other means, the flock remains at this level or increases only to the original number of birds. For example the four birds observed on Lot 1, Concession II, Mutrie Township provided a very good opportunity for study. While their dancing grounds the birds present did not exceed four, and after nesting the number of birds still did not increase. A nest was located and found to

contain 13 eggs. This nest was kept under observation and it appeared that the eggs had been predated before hatching. However, this was not confirmed until later when the area was checked on foot with the use of a dog. Only three birds were flushed on four different visits to the area.

Information gained from a Camp Foreman of Dryden Paper Company and verified by Division Staff indicated poor breeding success in a flock of Sharptails located north of Tache, Lot 5, Concession V, Revell Township. Originally this flock contained up to 60 birds. The flock was gradually reduced until it contained only 12 birds and it has remained at this number for the past three years.

The cause of poor breeding success does not appear to be the lack of suitable range and can be attributed to the predation of nests and young birds, also to poor weather conditions during nesting. Fox and lynx populations at the present time are at a high level in this area. However, further study is needed before any definite conclusions can be drawn.

As only a small number of birds are taken by hunters, no wings and tails were collected in order to determine sex ratios. Attempts will be made to collect this information if this work is continued in the coming year.

Hunting Pressure

The hunting pressure exerted on these birds is very light and in most cases is negligible. No known hunters in the area will hunt specifically for Sharptails. Ruffed Grouse hunters will, however, shoot these birds if they are encountered during a hunt. Grouse hunting is mostly done by driving along the numerous Township and Company roads and shooting any species of grouse encountered. Most grouse hunters use .410 shotguns and .22 calibre rifles. The use of a .22 rifle for "plinking" Sharptails out of the birch trees as they feed on the buds is the way in which the large flock north of Tache was exploited.

In a large percentage of cases when the location of a flock is known a hunter would have to spend considerable time in locating the birds and then he might only have one opportunity for shooting. After the flock is flushed considerable time would have to be spent to again re-locate the birds.

Summary

1. The survey was carried out during the spring and fall of 1962 in the Dryden area.

2. A total of 81 Sharptails was observed on 16 different locations.

3. Flocks ranged in size from one to twelve birds.

4. One dancing ground was located and only one bird was observed on one of the two dancing grounds located by Olson (1959).

5. The number of birds in each flock remains fairly constant.

6. Mating takes place during the early part of April.

7. Habitat is mainly one general type. Small streams are always present on site locations.

8. Hunting pressure on these birds is very light.

Conclusion

Due to the fact that Sharptails are not present in great enough numbers to make them an important game bird in this area, it is felt that the existing population could be increased by a directed and constructive management plan. This would eventually lead to the development of another game bird and add to the variety of game available to hunters in this District.

Recommendations for Management

1. Range improvement would not be necessary.

2. Attempts to control predators in the area in which flocks are located to benefit survival of young birds.

3. Trapping and banding of birds to gain information of composition and movement of flocks.

4. Ask public co-operation in reporting locations of flocks and kills of birds taken by hunting.

5. This type of project would be ideal for an active sportsmen's club, as they could assist a conservation officer in carrying out many phases of the work.

Acknowledgments

A vote of thanks is extended to all the Division Staff for their co-operation in recording all sightings of birds while performing their regular duties. Special mention should be made of the assistance given by Deputy Chief Ranger Ken. Alexander and Ranger Doug. Andersen. Thanks are extended also to A. R. Olson and District Biologist W. Charlton for their help and constructive criticism in the writing of this report.

References

Olson, A. R. - 1959 Report of the Status of Sharp-tailed Grouse Kenora District. Fish and Wildlife Management Report No. 50, Feb., 1960.

Miller, J.: 1960 Report on Sharp-tailed Grouse, Fort Frances Area - 1960. Fish and Wildlife Management Report No. 58, July, 1961.

APPENDIX I

LOCATION OF SHARPTAIL FLOCKS

(Olsen 1959)

Map Location No.	Area	No. Birds
1	Lot 8, Con. VI, Melgund Township	12
2	1 mile South of Flambeau Lake, Dryden Paper Company's Limits	2
3	N 1/2 Lot 8, Concession VI Wainwright	2
4	Lot 12, Con. I, Britton Township	5
5	Lot 1, Concession I Rugby Township	6
6	Lot 10, Concession VI Aubrey Township	8
7	N 1/2 Lot 1, Concession V, Sanford Township	6
8	N 1/2 Lot 4, Concession I, Sanford Township	7
9	Lot 9, Concession I, Sanford Township	16
10	Lot 11, Concession V, Mutrie Township	8

APPENDIX I - Cont'd.

LOCATION OF SHARPTAIL FLOCKS

McGillivray - 1962

Map Location No.	Area	No. Birds
11	Lot 1, Concession II, Mutrie Township	4
12	Lot 8, Concession V, Wabigoon Township	2
13	Lot 2, Concession V, Langton Township	1
14	Lot 8, Concession III, Mutrie Twp.	1
15	Lot 11, Concession IV, Melgund Township	5
16	Lot 5, Concession V, Revell Township	12
17	Lot 3, Concession VI, Revell Township	4
18	Lot 10, Concession VI, Hartman Township	10
19	Lot 12, Concession VI, Hartman Township	2
20	Lot 2, Concession VI, Zealand Township	8
21	Lot 9, Concession III, Van Horne Township	4
22	Lot 2, Concession III, Eton Township	7
23	Lot 15, Concession V, Aubrey Twp.	8
24	Lot 10, Concession IV, Sanford Twp.	1
25	Lot 7, Concession II, Rugby Twp.	8
26	Lot 12, Concession V, Aubrey Twp.	4

SPECIAL PHEASANT MAIL SURVEY MARKHAM TOWNSHIP LAKE SIMCOE DISTRICT, 1962

by
J. S. Dorland
Assistant Senior Conservation Officer

Abstract

At the conclusion of the open season for pheasants in 1962 in the regulated township of Markham, a total of 595 resident and non-resident township licences had been sold. A 20 per cent sample mail survey of licences sold indicated that 147 pheasants had been harvested in 188 man-days of hunting, for a hunter success figure of 1.7 birds per hunter (season). It required 1.28 man-days to bag a bird. Methods used to obtain the information are described. Tables are presented showing hunter success on various days and a comparison between the mail survey and the field survey.

Purpose of Survey

To ascertain hunter success, man-days to bag a bird, days hunted and other data during the pheasant season in Markham Township, some of which is to be used in comparison with field survey figures.

Method

Two methods were attempted, the first being dropped and the second carried on.

Method No. 1 - A questionnaire was placed in the same envelope with each township licence being mailed to the purchaser by the Markham Township Clerk's Office.

Method No. 2 - All names and addresses were obtained from the Clerk's Office. Twenty per cent or every sixth name on the list was sent a mailed questionnaire, together with a stamped addressed return envelope (121). This first questionnaire was followed up in two weeks by 55 second requests, then later twenty-four received third requests, plus some twenty-five telephone calls and personal contacts.

Results obtained from the two methods were:

Method No. 1 - Only 37 questionnaires or 6.2 per cent of total hunters purchasing licences were returned.

Method No. 2 - Of the 20 per cent contacted (121 hunters) we received 102 questionnaires back, or 84.3 per cent return.

Results of the Survey are Tabled as follows:

(1) Result of Mail Survey and in Comparison with Field Survey.

(2) Hunter Success for those hunters hunting over three days.

(3) Hunters and their Success during the Different Days of the Season.

(4) Number of Days of Hunting by Hunters.

Table No. 1

Results of Mail Survey in Comparison with Field Survey

	Mail Survey	Field Survey
Number of licences	595	595
Number of questionnaires forwarded	121 (or app. 20%)	
Number of hunters reporting	102 (or 84.3%)	421
Number of questionnaires received uncompleted	7	
Number of hunters reporting not hunting	10	
Number of hunters reporting hunting	85	
Number of pheasants harvested	147	206
Man-days hunted	188	
Average number of days per hunter	2.2	
Hunter success (bird per hunter-season)	1.7	1.08
Hunter success (bird per hunter-day)	.73	.49
Man-days to kill a pheasant	1.28	
Man-hours hunted		1462
Man-hours to kill a pheasant		7.1
Banded birds in total harvest (28)	19%	16%
Total No. of licencees not hunting 10.5%	62.6	
Estimated harvest for the township $595 - (\frac{10}{95} \times 595) = 63 \times \frac{147}{85} =$	920	
Length of average hunting day when checked		3.5 hrs.

Table No. 2

Hunter Success per Day

No. of Days	No. of Hunters	No. of Man-days	Harvest	Bird per Hunter	Man-days per Bird
1	34	34	19	.56	1.8
2	24	48	30	1.2	1.6
3	16	48	54	3.4	.89
4	7	28	21	3.0	1.3
5	1	5	1	1.0	5.
6					
7	1	7	3	3.0	2.3
8	1	8	11	11.0	.73
9					
10	1	10	8	8.0	1.3

Table No. 3

Number of Hunters and Their Success During Different Days

Date	Number of Hunters	Birds Shot	Success
Oct. 17 Wed.	54	65	1.2
" 18 Thurs.	15	8	.53
" 19 Fri.	13	10	.77
" 20 Sat.	47	31	.66
" 22 Mon.	13	7	.58
" 23 Tues.	9	4	.44
" 24 Wed.	9	Nil	
" 25 Thurs.	13	6	.42
" 26 Fri.	6	Nil	
" 27 Sat.	29	16	.55

Table No. 4

Number of Days of Hunting

Days of Hunting	Number of Hunters	Percentage of Total Hunters
1	34	40
2	24	28
3	16	19
4	7	9
5	1	1
6	Nil	
7	1	1
8	1	1
9	Nil	
10	1	1

Remarks

From the figures compiled for this report, we feel that five points stand out:

(1) Only 13 per cent of all hunters hunted over three days.

(2) The heaviest hunting pressure took place on the opening day and the two following Saturdays.

(3) Birds per hunter was the greatest on opening day.

(4) Per cent of banded birds harvested is up only 3 per cent from the field survey.

(5) Mail surveys such as this one are time consuming and expensive, but well worth the effort, since figures add to the value of field surveys and permit the determing of the total hunting harvest.

Acknowledgments

The work of the Markham Township Clerk, Mr. Harry Crisp, his assistant Mr. A. Schenfield and their staff in forwarding certain questionnaires, and in the preparation of a list of names and addresses of all township hunting licencees is gratefully acknowledged.

GROUSE AND WOODCOCK HUNTING STUDY, Lake Erie District, 1962

by
L. J. Stock, Biologist

Abstract

The study was designed to examine the success of hunters interested in grouse and woodcocks in Lake Erie District. Results showed that 44 hunters hunting 126 days (571.5 hours) bagged 128 grouse and 147 woodcocks for an average of 1.01 grouse and 1.17 woodcocks per hunter-day. They saw 4.51 grouse and 2.44 woodcocks per hunter-day (4.5 hours) and the percentages of birds shot to those seen were grouse 22.5 and woodcocks 47.7. October proved the most popular month for hunting these two species. Hunter success expressed as birds bagged per hunter-hour was lower than in 1961 for the two species combined; a decrease of 41 per cent for grouse and an increase of 4 per cent for woodcocks. Over the entire season hunters with dogs were slightly more successful than those without dogs.

Introduction

This report is the third in a series begun in 1960, and is designed to study the success of hunters particularly interested in grouse and woodcocks.

Methods and Procedures

All hunter success data are derived from questionnaires submitted by the hunters. Questionnaires and envelopes are issued to hunters before the hunting season. These along with wing collections (one from each woodcock) were mailed to District Office. The questionnaires were retained for compiling and the wings mailed to the Canadian Wildlife Service, Ottawa, for determination of sex and age.

The collection of grouse wings and tails was discontinued this year.

All hunting is done on foot.

Summary

Forty-four individual hunters hunted 126 days or 571.5 hours (4.5 hours per day). They bagged 128 grouse and 147 woodcocks an average per hunter-day of 1.01 grouse and 1.17 woodcocks.

During the same time in the field they saw 569 grouse and 308 woodcocks, a total of 877 birds. Per hunter-day (4.5 hours) they saw 4.51 grouse and 2.44 woodcocks (6.96 birds).

The percentages of birds shot of those seen were, grouse 22.5 and woodcocks 47.7.

October was the more popular month for hunting the two species. Sixty-six per cent of the grouse and ninety-five per cent of the woodcocks were bagged in this month.

The number of hunter-days and hours represented in this study was more than double that of the previous year.

Hunting success was lower than in 1961 for the two species combined. Expressed as birds bagged per hunter-hour there was a decrease of 41 per cent for grouse and an increase of 4 per cent for woodcocks. The number of grouse observed decreased 34 per cent and the number of woodcocks observed increased 33 per cent.

Norfolk is the most popular county and the more productive for grouse. Woodcock hunters in Elgin County were more successful than in any other county.

There was no difference in the number of grouse seen per hunter whether or not dogs were used. Hunters with dogs bagged more birds per hunter.

Over the entire season hunters with dogs were slightly more successful than those without dogs. In some cases dogs were no advantage in increasing the hunter success.

The woodcock wings collected (139) were forwarded to the Canadian Wildlife Service at Ottawa for further study. The sex, age and other data derived from this collection will be reported when the results of the examinations are received.

Results and Discussion

Weather all fall was generally fine with higher than average temperatures. The fine weather continued until the first week in December and this was followed by snow, high winds and temperatures near the zero mark. Leaf drop from the deciduous trees was some two weeks earlier in 1962 affording the hunter better visibility.

October is by far the most popular month for hunting grouse and woodcocks (Tables 1 and 11). However, there was considerable interest in hunting grouse in December when the season was extended to December 15 as it was in 1962. There was no woodcock hunting reported in December and very little in November. Hunter reports indicate that the woodcock migration was over or almost so in October (Tables 1 and 11).

Only six of the nine counties of the District are represented in the survey and in only three of these is the sample adequate to give any indication of the real hunting success. We know that there is considerably more woodcock hunting in all counties but few or no questionnaires were returned for inclusion in the study.

The submission of woodcock wings without a corresponding questionnaire indicated good hunting in parts of Essex and Kent Counties.

However, it is clear that Norfolk County leads in providing grouse hunting. Elgin County is the better area for woodcocks, followed by Norfolk (Tables 111, 1V and V).

In comparing the two seasons 1961 and 1962 the following differences are noted (Table V1):

(a) the number of hunter-days and hours represented is more than doubled;

(b) the grouse bagged and seen per hunter and per hunter-hour decreased 41 and 40 per cent, respectively. The grouse seen per hunter and hunter-hour decreased 43 and 34 per cent, respectively. This decrease in hunting success may be indicative of a lower population of birds or the larger sample may give a better picture of hunter success. As the grouse population is still at a high level both of these factors may be involved in reducing the number of birds reported bagged and seen.

The opposite conditions are evident in the case of woodcocks, where an increase is noted. The birds seen per hunter-hour indicate that the opportunities to see or flush birds increased by 33 per cent (Table V1).

The Use of Dogs

Only 11.5% of the hunters were accompanied by a dog (at least one dog in the party). The figures in Table VII show only a slight advantage over the season in using dogs and in some cases no advantage.

However, the small number of hunters with dogs may provide an unfair comparison. Data are not available to show the crippling loss or the number of birds flushed and retrieved by the dogs.

It is probable that the value of dogs would be more evident when the game population is low rather than high as it is at present.

The earlier leaf drop no doubt aided the hunters without dogs to see birds.

The number of returns submitted by individual hunters is shown in Table V111. The number of woodcock wings submitted by individual hunters is shown in Table 1X.

It is evident from Tables V111 and 1X that not more than one-half of the hunters submitting returns and wings are dedicated to the hunting of woodcocks. The others appear to be casual hunters only.

A sincere thank you to all who contributed to this study and we hope to hear from you again this fall.

TABLE 1

MONTHLY SUMMARY

Hunter-days, Hours Hunted, Birds Seen and Shot

Month	No. of Hunter-days	Man-hours Hunted	Grouse		Woodcock	
			Seen	Shot	Seen	Shot
Oct.	93	418.5	390	85	292	139
Nov.	22	101	124	30	16	8
Dec.	11	52	55	13	0	0
Total	126	571.5	569	128	308	147

Percentage of birds shot of birds seen:

Grouse	22.5
Woodcock	47.7

TABLE 11

MONTHLY SUMMARY

Percentage of Hunter-days, Hours, Birds Bagged and Seen Each Month

	Oct.	Nov.	Dec.	Total
Hunter-days and Hunter-hours				
No. of Hunter-days	93	22	11	126
Per cent of Total	74	17	9	
Hours hunted	418.5	101	52	571.5
Per cent of Total	73	18	9	
Birds Bagged				
Birds Bagged				
Grouse	85	30	13	128
Per cent of Total	66	23	10	
Woodcock	139	8	0	147
Per cent of Total	95	5	0	
Total Grouse and Woodcock	224	38	13	275
	81	14	5	
Birds Observed				
Birds Seen				
Grouse	390	124	55	569
Per cent of Total	68	22	10	
Woodcock	292	16	0	308
Per cent of Total	95	5	0	
Total Grouse and Woodcock	682	140	55	877
	78	16	6	

TABLE 111

COUNTY SUMMARY

Hunter-days Hours Hunted Total Birds Seen and Shot

	No. of Hunter-days	Hours Hunted	Grouse		Woodcock	
			Seen	Shot	Seen	Shot
Elgin	37	117	104	20	109	54
Essex	2	16	15	7	-	-
Haldimand	4	23	17	2	22	14
Lambton	2	6	5	2	13	4
Lincoln	10	56.5	32	5	48	23
Norfolk	71	353	396	92	116	52
Total	126	571.5	569	128	308	147

TABLE IV

HUNTER SUCCESS

Grouse & Woodcock

by County

	Elgin	Essex	Haldi-mand	Lamb-ton	Linc-oln	Nor-folk	District
No. of Hunter-days	37	2	4	2	10	71	126
Total hours hunted	117	16	23	6	56.5	353	571.5
per hunter	3.2	8	5.8	3.0	5.7	5.0	4.5
Birds bagged							
Grouse	20	7	2	2	5	92	128
Woodcock	54	0	14	4	23	52	147
Total	74	7	16	6	28	144	275
Bag per hunter-day							
Grouse	0.54	3.5	0.5	1.0	0.5	1.29	1.01
Woodcock	0.46	0	3.5	2.0	2.3	0.73	1.17
Total	2.00	3.5	4.0	3.0	2.8	2.02	2.18
Bag per hunter-hour							
Grouse	0.17	0.44	0.09	0.33	0.09	0.26	0.22
Woodcock	0.46	0	0.60	0.67	0.41	0.15	0.26
Total	0.63	0.44	0.70	1.00	0.50	0.41	0.48
Hours to bag a bird (Grouse & Woodcock)	1.58	2.28	1.43	1.0	2.0	2.45	2.08

TABLE V

BIRDS OBSERVED

Per hunter and hunter-hour
by county

	Elgin	Essex	Hald-imand	Lamb-ton	Linc-oln	Nor-folk	District
Birds Seen							
Grouse	104	15	17	5	32	396	569
Woodcock	109	0	22	13	48	116	308
Total	213	15	39	18	80	512	877
Birds Seen Per Hunter							
Grouse	2.81	7.5	4.25	2.5	3.2	5.57	4.51
Woodcock	2.94	0	5.50	7.5	4.8	1.63	2.44
Total	5.75	7.5	9.75	10.0	8.0	7.20	6.95
Birds Seen Per Hunter Hour							
Grouse	0.88	0.93	1.35	0.83	0.56	1.12	1.0
Woodcock	0.93	0	0.95	2.17	0.84	0.33	0.54
Total	1.81	0.93	2.40	3.0	1.40	1.45	1.54

TABLE VI

Birds Bagged and Seen 1961-62 Compared

	1961	1962	Difference	Difference Per cent
No. of Hunters reporting - (Hunter-days)	53	126	+ 73	+137
Man-hrs. hunted	250	571.5	+ 321	+128
Birds bagged per hunter -				
Grouse	1.7	1.01	- 0.7	- 41
Woodcock	1.0	1.17	+ 0.17	+ 17
Total	2.7	2.18	- 0.5	- 19.0
Birds bagged per hunter-hour				
Grouse	0.37	0.22	- .15	- 40
Woodcock	0.24	0.25	+ .01	+ 4.0
Total	0.58	0.47	- .11	+ 19.0
Hours to bag a bird	1.7	2.08	+ 0.38	+ 22.4
Birds seen per hunter				
Grouse	7.2	4.51	- 2.7	- 37.5
Woodcock	2.0	2.44	+ 0.44	+ 22
Total	9.2	6.95	- 2.26	- 24.3
Birds seen per hunter-hour				
Grouse	1.52	1.0	- 0.52	- 34
Woodcock	0.42	0.54	+ 0.12	+ 28.5
Total	1.94	1.54	- 0.40	- 20

TABLE V11

Birds bagged and seen with and without dogs

	PARTIES	
	With Dogs	Without Dogs
* No. of hunter-days	14	107
Per cent of total	11.5	88.5
Grouse total seen	63	479
" " bagged	24	109
" seen per hunter	4.5	4.5
" bagged per hunter	1.7	1.0
Woodcock total seen	27	262
" " bagged	5	131
" seen per hunter	2.0	2.4
" bagged per hunter	0.35	1.2
Grouse and Woodcock - seen per hunter	6.5	6.9
- bagged per hunter	2.0	2.2

* at least one dog in a party

TABLE V111

Number of Questionnaires submitted by individual hunters

7	hunters	returned	1	questionnaire
2	"	"	3	"
1	"	"	6	"
1	"	"	12	"
1	"	"	13	"

Total individual hunters 44

TABLE 1X

Number of woodcock wings submitted by individual hunters

4	hunters	submitted	1	wing
1	"	"	2	"
1	"	"	6	"
1	"	"	7	"
2	"	"	8	"
1	"	"	9	"
1	"	"	21	"
1	"	"	30	"
1	"	"	42	"

Total Wings - 139

Some hunters submitted for the entire party

PUBLIC OWNERSHIP OF A RESOURCE PRODUCED ON PRIVATE LAND*

by
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Fish and Wildlife Branch

Abstract

This paper reviews the whole question of public hunting on private land. The history of hunting grounds is traced back to ancient times and certain rights laid down by the early English Forest Charters in Saxon days are discussed. According to English Common Law which prevails in Canada and the United States, except where it has been altered by local statute, game belongs to the state but the right to possess it is in the land. Thus, while wildlife is publically owned, it is produced on private land and is unavailable to the public without trespass. The owner has the right to decide who shall use his property for any purpose. It is suggested that a positive way to meet the problem of public hunting is for the public to set aside, lease, or purchase hunting grounds.

Wildlife is a renewable natural resource, based on the land. There is no need here to go into the explanation of these statements. We are simply concerned with its land base. Wildlife is publically owned. The land which produces it and whose management or mismanagement determines its presence or absence, is privately owned. The public who own the wildlife cannot use it without trespass.

Let us concede that certain lands remain publically owned, and that this may make some of them available for hunting. In the Province of Ontario most of the land - over 300,000 square miles--is publically owned. It was obtained by treaty from the Indians, who did not surrender their hunting rights so long as the land itself remains unalienated. In original theory it is held only until somebody settles it, and puts it to use. It is a fact that for some uses it has been found desirable to keep enormous areas in public ownership, but the basic use is agriculture, and where the land can be put in farms it has become privately owned.

* Paper presented at Seminar on Private Land Use at Cornell University, Ithaca, N. Y., April, 1961.

All large centres of population are in such areas, and the great tracts of public land are so far away from these centres that they are of as much use to the average New York hunter as they are to the average Ontario hunter. In each case use means a special trip, whether more or less long. Therefore, to the average hunter, the game is his but the land close to home is private.

We should explain this paradox, a public resource on private land. In Canada, the whole structure is founded on the Common Law, which has guided the drafting of statutes. To its principles, I believe you in the United States also give allegiance. A little history is necessary, as a means of establishing and explaining our present rules and practices in one operation.

I have mentioned the Indians, but we are concerned more with the primitive background of our own society. While the tribes which founded our culture were still dependent on hunting there were two important developments. Success in the chase brought the hunter an enormous social prestige, and the chase itself became hedged with magic and ritualized. This addition of meaningful actions going beyond the physical need of the instant made a game of it, bringing it within the play definition of Huizinga's "Homo ludens"(1) wherein civilization itself is seen clearly as the evolution of these physically unnecessary activities. When the chase became no longer necessary to survival it lost none of its prestige or magic. Both were, if anything, intensified and it became socially one of the most cherished of the play activities.

It is clearly implied in the action of early rulers in securing to themselves private or enclosed hunting grounds that exclusive rights were not recognized in the open countryside. We can take as an illustration the concept of "paradise". Both the Greeks and Hebrews used it in our meaning of "heaven". The word, however, is clearly Persian and to the Persians it was nothing more nor less than a private hunting ground. This the Greeks understood perfectly when they were writing about Persia. You may recall that, in Xenophon's Cyropaedia, when he describes how the boy Cyrus was sent by his mother to visit her father, the Median king, the old man, tried to get the youth to stay with him. Among other inducements he said "What's more, I'll give you all the game in my paradises, and" - most significant to us - "if that's not enough, I'll have more caught up outside and released". Some degree of enclosure is obvious, and of course, the Hebrew "pardesh" of Eden, for which the writer of Genesis borrowed the Persian word, had a wall and a gate. In order to achieve the state of bliss you had to hedge out the rest of the world in one way or another. Under Justinian's Institutes game became the possession of the hunter when and where he killed it.

(1) Homo ludens, a Study of the Play Element in Culture. Routledge and Kegan Paul, London, 1949.

However, Roman patricians had, according to Pliny, set up private hunting grounds at an early date, and they also recognized a form of harbouring animals "villatico pastia" as they said, in which the state of the animals went all the way from completely domestic to completely feral (though dependent), without any worry over drawing fast lines.

It is interesting to note that within this society there existed a class of person who made a livelihood out of exploiting game. He was simply one unit in a diversified society, and his activities seem to have lost dignity because he depended on them.

Christianity introduced a new concept of social structure and land use, the feudal system originating in a combination of religious belief and the experience of the Dark Ages. It crystallized when Charles the Great, a Frankish tribal chief, was crowned Holy Roman Emperior, but had been a long time in forming. The anointed ruler held all land from God. In return for certain services he parcelled it out to his followers, with some also to the Church in fulfilment of his own obligations.

Into the manorial unit the use of game fitted in as simply as the tilling of fields. Sport, requiring the maintenance of a stable and a kennel, centred on the baronial family, and fitted in very well with their obligation to ride to the king's standard in time of war with whatever number of mounted and armed men their power and dignity prescribed. The major game species were hunted. The lesser edible varieties, over and above the very small numbers needed for falconry and austringing, were harvested by men skilled in the use of net, snare, decoy or cockshutt as the case might be. In Doomsday Book the productivity of the estate in such respects was rated in the same way as its capacity to produce wheat. Doomsday even listed the hawks' nests, from which the young could be taken and sold.

Now, the question is, where, in all this, did ownership lie? To explain this we shall have to bring in the concept of "foresta". I use this Latin word rather than "forest". We have a modern idea of forest in terms of trees, but in its origin it had nothing whatever to do with trees. Schlich's Manual of Forestry says that it has and derives the word from the Latin "foris" -- "out-of-doors" -- but, though there may be a common stem involved, you will not find "foresta" in a lexicon of classical Latin. In fact its first recorded use is in 8th Century deeds from the Frankish kings. I refer you to W. Kaspers' excellent paper on this subject in the July, 1959, "Forstarchiv".

It is a Gallo-Roman legal term of Celtic origin and means something of value that belongs to you ouside your immediate pale, something otherwise unowned that you are recognized as owning. It could be anything from sea shells on the seashore to mushrooms on the common. Kaspers cites a deed of 716 "aquis aquarumque decursibus cum foreste suo". Obviously the "forest" of waters is not trees, and is surely a fishery.

Because of the tremendous social prestige of hunting and the still important place of wildlife as a product it was clearly the most prized of all "foresta" and its ownership had to be settled very early. Plainly, the land and the crops of vegetation and domestic beasts went with the manor, but what about the wild things that flew and skipped all over the place? It was established from the first that they remained the possession of the Crown, even on the deeded lands. It was because of the vagrant nature of wild creatures, and the impossibility of pinning them down to any one piece of property that they have remained "public", but this has likewise determined that such ownership is a matter of privilege and not a matter of right, a factor that has governed the introduction of modifications of ownership.

It is obvious that though the king had a privilege in game he could hunt only so much in a day or a year, and that in fact his subjects hunted and used game all the time, and had established customs that everybody knew and accepted. With royal ownership so clearly stated, however, the barons prized their hunting too highly to leave anything to caprice, and even in Saxon days, when the feudal system in England was just getting started, a Forest Charter was obtained from King Canute. A charter is not a statute establishing something new. It is a formal acknowledgment on the part of the king that certain things are so. This was the first of a number of Forest Charters and it is interesting that the people prized their hunting rights so highly that they got them recognized while "foresta" was still a comparatively new word, and they didn't bother to get their civil rights recognized until centuries later, in the days of King John, whose Great Charter you have heard about. King John, along with all the other things he agreed to, said that he recognized the Forest Charter, but the most recent Forest Charter, from which the Common Law on game stems, dates from Henry VIII.

As an aside, and to anticipate questions, the modern meaning of forestry comes from the habit of mediaeval kings of setting aside tracts - royal "foresta" - for their own hunting. The people who lived in these places had their own courts and there were "foresters" whose basic job was to keep up the stock of game. The people, in their cutting of trees, had to conform to a regimen

that was designed to maintain the coverts. When the deforestation of Europe reached the wood-famine stage these managed woods and this art of using the stands without destroying them became very important, but in spite of everything, even today a Scottish deer forest generally has no trees.

What the Forest Charters said was that in spite of royal ownership, there were certain rights, whether inherent or granted, that people might have to game.

They were:

Chase - The right to buck, doe, fox, marten and roe on unenclosed lands.

Park - The same right in an enclosure.

Warren - The right to preserve and use hares, conies, game birds and wildfowl on lands enclosed or unenclosed.

The first two were originally specifically conveyed. The last was inherent in the manor, and on common lands and the undeeded foreshore use was everybody's. It was here that the Statute Law made its entry into the field of game, but we are not concerned with the history of game laws and licences, rather, just with ownership which is all common law with us.

The present status of the ownership of wildlife everywhere where the English Common Law prevails - and I am told that this includes the United States unless it has been effectively altered by statute - is that game, being legally vagrant and thus res nullius, belongs to the state, de priviligio, but that the right to possess is in the land, ratione solis. The limitations of such possession have been determined by court cases. In fact, the number of recorded judgments on game matters is a thing to marvel at, and reflects an enormous social significance of wildlife that we should never forget, or allow anyone else to forget. All I can do is to cite an example. Young birds in a nest, as long as they are immobile, belong to the landowner, though he is restricted in what he may do to them by the laws protecting birds. As soon as they can fly, they become public. When the hunting season comes, they remain public property until immobilized, and then, by Common Law, they become the property of the person on whose land they become immobilized. I stress the mobility because it is linked with the public privileged ownership. Notice the divergence from Justinian.

I hasten to add that in pioneer days the custom of hunting on farm lands became established and the hunter always kept his bag. In fact, unless the landowner exercises his rights on the spot they vanish. Only twice in the history of Ontario has a farmer gone out and laid claim to the hunter's game, but this has been enough to make it clear that the Common Law still governs ownership. Under our conditions this might become important but it is not important yet. I wonder if it has actually been specifically altered in the United States.

What is very important is the fact that though it has a privileged ownership in wild game, in order to hunt the public has to enter on private lands. I shall not attempt to cover the history of trespass, but simply say that there is no doubt that the owner has the right to decide who shall use his property for any purpose. Our courts have clearly established that although hunting is to be considered innocent trespass, unless it is accompanied by some offence against person or property, it is nevertheless trespass, and the landowner has the right to prevent it.

This Common Law right to prevent trespass has been reinforced by statute in almost all Game Laws -- certainly in ours. In England this interest dominates the statute; with us in Ontario it is just one little section, but it is the same thing and serves the same purpose.

Throughout the whole legal system controlling trespass there is a common principle operating which we should drag out into the open and take a good look at. This is that where the trespass is essentially innocent, and especially where the public has a privilege of some sort, such as the ownership of game, or, as established by law in Britain, of certain types of scenery, even on private lands, the interest of the owner in restricting the use of his land is a purely private interest, not public interest, and therefore he cannot call upon the public officer to enforce it. One cannot expect the public to assist actively in abating its own privileges. Our Ontario game law spells all this out. It makes hunting and fishing trespass, which is already an offence, into an offence under the game law, but specifies that the landowner must, in order to raise the offence beyond petty trespass, serve notice that hunting and fishing are prohibited by him, and must also be his own officer and lay his own charges, which would have been so even if it had not been spelled out.

This philosophy is sometimes found also in the administration of the Criminal Code. The type of offences involved in petty vandalism (as opposed to shooting a cow or setting the barn on fire) are what are known as non-indictable offences. This is a matter of legal procedure, and so far as a landowner is concerned it means that in these minor offences it is often true that whoever lays the charge is stuck for the costs if

the charge fails. That would make no difference if the police prosecuted. There has, however, been a tendency for them to do nothing more than tell you where to go and whom to see in order to lay a charge. There is an old police maxim about steering clear of private quarrels, reinforced with the old story about the policeman who used force majeure on a man who was beating his wife only to be knocked out by the infuriated lady with a skillet.

It is easy to see that this philosophy grew out of the days when the public were being protected from the lords of the manor, who, as any kindergarten-age television viewer can tell you, were quite capable of looking after their own interests, and were left to do so. Estate owners nowadays are also quite capable of looking after their own interests, and so are the proprietors of shooting clubs. So, may be also, let us note, the farmers of the future. We are told that in the U. S. A. six million farms in 1920 or so have shrunk to about four million. The manpower has shrunk even more drastically, but the production has gone away up. The prediction is that in the future less than two million farms will produce more than enough food and fibre for 300 million people. Obviously such a change will mean that the farms of the future are not going to be much like the units we see today, and something tells me that they may well be able to look after themselves. It may be that what we are most concerned with are the embattled remnants of the pioneers, but they may be on the scene for a long while yet, and a free and willing professional protection of property is a fair rental for free use of land. Our practice looks in that direction more and more.

Everywhere on this continent in pioneer days hunting was free. Even when I first started I walked out from my home village, and though I often got five or six miles away I think that most of the farmers who saw me in the distance knew who I was, and also knew any other hunter they saw. Today the hunter may have driven one hundred miles and he probably drove thirty. There is a real old fashioned reluctance to turn them away, but there are misgivings about numbers, based entirely on the fact and it is a fact, that hunting, especially, is the farmer's recreation, as opposed to, let us say, golf, and he hates to see his own place too thoroughly shot up before he gets out himself. It's all very well to say that no amount of hunting pressure will make any difference to the rabbits. You know that the first available rabbit is a lot more available than the last available rabbit. Also there is a real and growing resentment of drives. The farmer who doesn't mind a couple of hunters balks at a couple of carloads or more, and is fearful of the mass use of his land that urbanization and the progressive multiplication of hunters brings. He resents also the inevitable vandalism.

In an area of law where he never used to have to do anything the farmer resents being told that he must do his own policing. As one farmer told me once, he is a lot like a groundhog, - if someone stares at him he wants to go down a hole. This whole business is something he did not bring on himself and he wants somebody else to do something about it.

Now, what is being done, or has been done, or can be done? At one extreme, population is too dense to permit discharge of firearms. The tendency to use this police power where hunting might otherwise take place is found here, though there are exceptions, and in Europe the exception is the rule. At the other of course pioneer conditions still prevail.

One thing you could do would be to abolish this remnant of the feudal system and establish the ownership of game in the soil along with other products. The American Revolution was political rather than social. It established sovereignty and left the law and the social structure alone. I doubt, certainly, whether anybody ever wanted this sort of ownership. The growth of socialism makes the development less likely as time passes. The French Revolution, on the other hand, was a real bourgeois revolution. The Code Napoleon placed the ownership of game in the soil. It so happened, however, that the Code Napoleon never got firmly established until after the disturbances of 1848. Then it became the basis of present laws in most European countries.

Ownership apart, the Code Napoleon worked for game only on large estates. The average holding was not large enough for effective management by itself. The result has been an adoption of some form or other of the revier system. In its Teutonic form nobody may hunt at all unless the area is a recognized revier. Reviers have a minimum area, so that the small farmers are forced together. There is a state hunting authority which approves a management plan for each revier, set up by a recognized competent person, and the plan and the hunting are regulated by a book of rules that makes our fat and confusing game law manuals fade into insignificance.

There are many variants, from country to country in the revier system. In some places the local equivalent of the fish and game club controls the hunting and prepares and carries out the management plan. Soviet Russia, a land full of the world's most inveterate hunters, some years ago graduated from the feudal system to public hunting not too much unlike ours, but has recently, perhaps influenced by neighbours like Poland and Czechoslovakia, gone into the revier system. There are times, when I read European literature, that I think the formulary of the revier system contains in it something that must satisfy some basic human instincts, and if this be true the devisor and administrator of farmer-hunter cooperatives might do well to study it. In Ontario we have no high level cooperatives as yet.

A great deal of trouble arises when landowners who are indifferent to hunting are aroused by trespass and vandalism. Unfortunately it seems impossible to have dozens of man-days of use without vandalism and the more game there is the more trespass and vandalism there is going to be. We get a strange hodge-podge of negative and positive action. For example, in Alberta the law says that if you forbid hunting and fishing on your own property, you can't hunt or fish there yourself. It is my personal opinion that this law would never stand up to a court challenge. It has never received such a challenge, partly because farmers suffer severe crop damage from ducks and geese and because the Government controls the supply of fish for stocking private ponds. It might be hard to find another example of legal action against the farmers.

An obvious thing, done in Ontario, was to prohibit drives without consent. The limit is 12 persons and it would have been six, but for the opposition of very farmers it was meant to protect.

Permission hunting is a negative law in the opposite direction. It works in Canada in western areas where property holdings are large enough to contain a hunting party for a day, and where game damage, especially waterfowl depredations, is severe enough that any hunter, no matter how homely his face or uncouth his accent, is sure to find someone who wants him. In the east, where it has been tried, it has never stuck. In Tony Peterle's N. A. Wildlife Conference paper on "The Hunter", it was reported that even where access is supposed to be requested it generally is not. I have hunted in states where you are supposed to ask, with people who, if anyone could, would be expected to heed the rules and I have never been in on an asking ceremony. There were the same difficulties that we have here - no building in sight, nobody knew who owned the place, or where he could be found, and so on. The usual answer was that so and so, usually the local conservation officer who carries the whole world on his shoulders so lightly, says "you can go in anywhere along here." In one of our areas where consent was tried the farmers actually asked to call it off. They found themselves going to some pains to come in and talk to prosperous strangers who turned out to be mere hunters. Their wives, by contrast, were alarmed at being confronted at the door by strangers.

My feeling is that consent is a negative and unconstructive solution. Bias is unavoidable. In a test I once heard reported, Michigan found that one of their staff could hunt on any farm in the state. The same man could have sold refrigerators to Eskimos without the least worry over the language barrier. Some quite respectable persons got a different response. Suppose you have a black face to go with your southern accent? William Blake's poem, "The Angel", describes the sort of people who can hunt under the permission system.

There have been a variety of cooperative programs in the U.S., on which I cannot report. I detect, however, a resemblance to various forms of the revier system and suggest that there is a common principle at work. Rental and intensive management go together. Where the farmer cooperates without rental there is quite generally some other incentive. It varies from having the sportsman do some of his chores to extensive plantings.

I am convinced that pheasants to release are an incentive, regardless of how little worth the biologist attaches to them. The farmer sees them as restoration. He likes game, and a pen or two of birds is all it takes to break down his objections to hunting.

There is a touch of this in our Regulated Township "arrangement" in Ontario. Years ago, when pressure of "pheasant days" made itself manifest, we set up an arrangement whereby the rural municipalities were given authority to issue and sell a special licence and restrict its sale, and in order to hunt, within the terms of this licence, you were compelled to have one. It violates tradition in that the public enforces a restriction on its own privileges for a private cause. On the other hand it is accepted that most lands, even in densely settled areas are open without ceremony, to those who have this licence. All the farmers asked for at the time was a few birds - a cheap rental for so many acres, though we must face the fact that the premise involved in the releases may be false. The licence does not cover all hunting and is applied only in congested areas. It does cover the conspicuous forms of hunting on farm lands in these areas, namely pheasant, rabbit and fox. We had to set fees because there was a tendency to run into grandiose and non-biological "conservation" schemes, and rarely do the rural municipalities simply dump the revenue into their general fund.

As I see it, the positive way to meet the problem of public hunting is for the public, who now replace the ancient kings in game ownership, to do just what the kings did, namely, "afforest", in the ancient sense, that is set aside or purchase or lease hunting grounds. This process, new with us, has reached enormous proportions in the United States. Just as in the olden days, the management of these areas is developing into a profession by itself. There is some most remarkable flying off at tangents going on I suggest that the whole business of multiple use has heretofore had little meaning because some uses were so poorly developed. There will soon be a time, a need in fact, for someone to toss agriculture, forestry, soil conservation, water conservation, nature preservation, angling, hunting, boating, picknicking and other reasonable activities on publically owned areas into the balance for the various lands available, and see what can be made of them. I don't propose to attempt this here.

THE EFFECT OF SEASONAL VARIATIONS IN AIR TEMPERATURE ON THE AVAILABILITY OF RAINBOW TROUT, Salmo gairdneri Richardson

by
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Abstract

The purpose of the Nameless Lake investigation was to assess the effect of seasonal air temperature fluctuations on the availability of an introduced rainbow trout population during the first season it was subjected to angling. During the 1960 season, 1,302 rainbow trout were caught by 637 fishermen fishing 2,701 hours. The availability of the trout varied from a monthly high of 1.05 fish per rod-hour in May to a low of 0.22 in August. A significant correlation was found to exist between the mean weekly air temperatures (advanced two weeks) and the weekly catch per unit effort of Nameless Lake rainbow trout.

Introduction

Seasonal changes in physiological characteristics occur in many animals. In poikilotherms such changes are often believed to be brought about by regular fluctuations in the environmental temperature. Assuming that availability, measured as fish per rod-hour, is an indicator of fish activity, the response of the animal to temperature changes may be assessed in the field. Smith (1952), Fry (1937, 1939, 1949) and Fry and Kennedy (1937) suggest that seasonal variations in the thermal conditions of waters have a marked effect on the activity and distribution of fish species. The aim of this investigation was to assess the effect of seasonal air temperature fluctuations on the availability of an introduced rainbow trout population during the first season it was subjected to angling.

Fry (1939) also points out that variations in availability may be related to the size composition of the fish population, viz: as the season progresses there is recruitment of fish of angling size. Recruitment could not have been a factor in this study since only one lot of fish had been introduced and these were all of desirable size by the time the lake was opened to angling. This last statement, while only an assumption, seems reasonable in view of the size of the fish taken by anglers throughout the season.

The Lake

Nameless Lake, located on Manitoulin Island, Ontario, near the town of Gore Bay, was selected for this study since it is privately owned and access to it is confined to one place. The lake was chemically treated with rotenone in August of 1958 and stocked with 15,000 fingerling rainbow trout 3 to 4 inches in length in May, 1959. It was opened to angling in May, 1960. The creel limit was five fish per angler and the season covered the period May 1 to November 30 in accordance with the regulations set down by the Ontario Department of Lands and Forests.

Nameless Lake is a natural lake fed by numerous underground springs and drained by a sink hole. The lake normally has a surface area of 211 acres and occupies an oval-shaped basin, regular in outline. The western rim of the basin is bordered by an abrupt limestone scarp, while the other shores slope gently to the water. The lake has a maximum depth of forty feet for approximately one-third of its surface area and an average depth of twenty feet.

Chemically, Nameless Lake, is a hard water lake with a pH of 8.0 and a methyl orange alkalinity of 140 p.p.m. Dissolved oxygen measured in late August varied from 8.6 p.p.m. at the surface to 8.4 p.p.m. at fifteen feet to less than 2 p.p.m. at thirty-six feet.

Prior to reclamation the lake supported a warm water fishery made up of smallmouth bass Micropterus dolomieui Lacepede, yellow perch Perca flavescens (Mitchill), and rock bass Ambloplites rupestris (Rafinesque). Also present were the American smelt Osmerus mordax (Mitchill), the common white sucker Catostomus commersoni (Lacepede), the pumpkinseed (Lepomis gibbosus (Linnaeus) and several species from the minnow family. It was estimated, after the reclamation, that from 12 to 20 tons of fish had been removed with the rotenone treatment. An experimental netting program carried out during August, 1960 produced three common white suckers, suggesting that the reclamation was incomplete.

The collection of statistics on the fishery was a co-operative undertaking by the owner, Mr. P. Dennis, the local conservation officer, Mr. J. H. Bailey and the author. All fishermen were interviewed for the number of fish caught and the number of hours spent fishing. At intervals throughout the season catches were sampled for measurements of weight and length. While the data were recorded daily, they have been compiled on a weekly and monthly basis.

Catch Data

During the 1960 season, 637 fishermen spent 2,701 hours on the lake and caught 1,302 rainbow trout. The lake was subjected to 12.8 hours fishing pressure per acre which provided a yield of 6.2 fish per acre or about 11 pounds per acre by weight. In May, the fish averaged 14 inches in length and weighed approximately 1.25 pounds, while in October, they averaged 17.5 inches and weighed 2.25 pounds. The season average was 15.8 inches and 1.75 pounds. Table 1 presents the creel data compiled on a weekly and monthly basis.

Seasonal Characteristics of the Catch

The catch per unit effort or availability of rainbow trout, as shown in Table II, varied from a monthly high of 1.05 fish per rod-hour in May to a low of 0.22 in August. There was a gradual decline in fishing success from the high of May through August, followed by an increase in September and October. Catch per angler paralleled availability through the angling season, decreasing from a monthly high of 3.6 fish per angler in May to a low of 1.3 in August and increasing to 2.9 in October.

Temperature Availability Relationship

Embody (1927) suggests an optimum water temperature range of 55°F - 60°F for the feeding and growth of the rainbow trout with upper and lower limits of 77°F and 40°F, respectively. Buschkiel (1931) widens the range to 53.6°F - 68.0°F. Garside and Tait (1958) found the 13°C (55°F) was the preferred temperature for this species. Cooper and Bensen (1951), Cooper (1953) and Bensen (1954) report that with brook trout Salvelinus fontinalis (Mitchill) there appears to be a close relationship between the volume of food in the stomachs of the fish and water temperature throughout the angling season. The Nameless Lake investigation suggests a parallel in the influence of seasonal air temperature fluctuations on the activity of rainbow trout.

Unfortunately, water temperatures were not available for Nameless Lake and air temperatures as recorded by the Meteorological Station at Gore Bay, Ontario, were used in this paper. It has been shown, however, by Fry and Watt (1955) that for each month from June to October, there is a linear relation between the thermal sum for the surface waters and the monthly mean of the air temperature. McCombie (1959) suggests that the seasonal relationship between monthly mean air temperature and monthly mean surface water temperature may be described by two linear regressions - one illustrating the warming period and the other the cooling period. When the Nameless Lake weekly catch per unit effort data were plotted against weekly mean air temperature a lag of about two weeks in the catch curve was noted. This lag may be explained by the slow response of water to changes in air temperature, due to the water's high specific heat.

With this lag in mind, mean air temperatures, two weeks previous to the weekly catch per unit effort totals, were used to calculate the regression of the latter on the former. The correlation was found to be significant at the one per cent level.[1] Table II provides the statistics from which the regression was calculated. Figure I illustrates the correlation with X representing monthly means. The monthly means fall close to the calculated line of regression. This suggests that most of the scatter in the weekly totals are due to statistical error. With the October record falling well below the regression line perhaps the removal of fish, without recruitment, has had an effect on availability.

The reclamation of Nameless Lake and the subsequent introduction of a cold water species that exhibits this seasonal variation in catch success provides the area with a balanced catch per unit effort throughout the entire spring to fall angling season. While the warm water fishery of other lakes is closed or at a seasonal low, Nameless Lake produces a high catch per unit effort. Likewise, when the success drops in the rainbow trout fishery the warm water species are at a high.

Summary

1. Nameless Lake, located on Manitoulin Island, Ontario during its first season of fishing after reclamation and the introduction of rainbow trout produced 1,302 fish for 637 anglers fishing a total of 2,701 hours.

2. Catch per unit effort varied from a monthly high of 1.05 fish per rod-hour in May to a low of 0.22 in August and increased to 0.55 in October.

3. Catch per angler followed the same trend decreasing from 3.6 fish per angler in May to a low of 1.3 in August and rising to 2.9 in October.

4. When weekly air temperatures are advanced two weeks, a correlation, significant at the one per cent level, is noted between the mean weekly air temperature and the availability (catch per unit effort) of Nameless Lake rainbow trout.

5. The plotting of the monthly means suggests that the scatter of the weekly means may be due to statistical error. The removal of fish without recruitment appears to have resulted in a decreased availability during the month of October.

1 r= .725 25 degrees of freedom
5%= .381 1%= .487

Literature Cited

Bensen, Norman, G. 1954. Seasonal fluctuations in the feeding of brook trout in the Pigeon River, Michigan. Trans. Amer. Fish. Soc. 83 (1954) 76-83.

Buschkiel, A. L. 1931. Salmonidenzucht in Mitteleurope, Stuttgart.

Cooper, Edwin L. 1953. Periodicity of growth and change of condition of brook, brown and rainbow trout in the Pigeon River, Otsego County, Michigan. Prog. Fish. Cult. 13(4) : 181-192.

Embody, G. C. 1927. Stocking policy for the Genesee River system. A biological Survey of the Genesee River System. State of New York Conserv. Dept., Suppl. to the 16th Ann. Rep., 1926. Albany: 12-28.

Fry, F. E. J. 1937. The summer migration of the cisco, Leucichthys artedi (Le Sueur) in Lake Nipissing, Ontario. Univ. Toronto Studies, Biol. Ser. 44 (Publ. Ont. Fish. Res. Lab., 55) 190 pp.

_____1939. A comparative study of lake trout fisheries in Algonquin Park, Ontario. Univ. Toronto Studies, Biol. Ser. 46 (Pbl. Ont. Fish. Res. Lab., 58) 65pp.

_____1949. Statistics of a lake trout fishery. Biometrics, (1949) 5(1) : 27-67.

_____1951. Some environmental relations of the speckled trout (Salvelinus fontinalis). Proc. Northeast Fish. Conf. May, 1951 : 1-25 (mimeographed)

Fry, F. E. J. and W. A. Kennedy. 1937. Report on the 1936 lake trout investigation, Lake Opeongo, Ontario. Univ. Toronto Studies, Biol. Ser. 42 (Publ. Ont. Fish. Res. Lab. 54) : 20 pp.

Fry, F. E. J. and K. E. F. Watt. 1955. Yields of year classes of the smallmouth bass hatched in the decade of 1940 in Manitoulin Island waters. Trans. Amer. Fish. Soc. 85: 135-143.

Garside, E. T. and J. S. Tait. 1958. Preferred temperature of rainbow trout (Salmo gairdneri) Richardson, and its unusual relationship to acclimation temperature. Can. J. Zool. 36:563-567.

McCombie, A. M. 1959. Some relations between air temperatures and the surface water temperatures of lakes. Limnology and Oceanography. 4(3): 252-258.

Schaeperclaus, W. 1933. Lehrubuck der Teichwirtschaft. Berlin, 289 pp.

Smith, M. W. 1951. Limnology and trout angling in Charlotte County lakes, New Brunswick. Journ. Fish. Res. Bd. of Can. 8(6) : 383-452.

Figure I

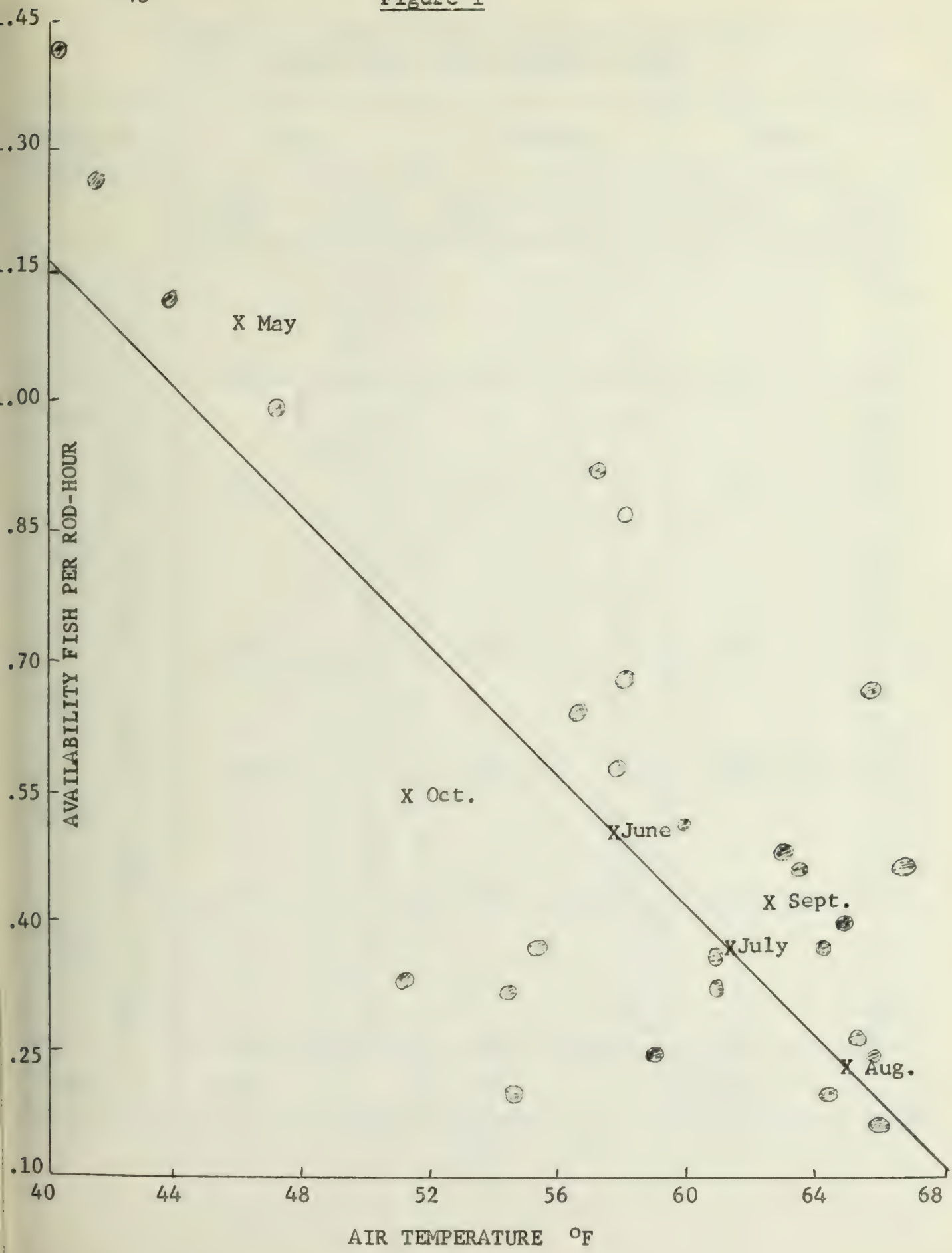
.45
.30
.15
.00
.85
.70
.55
.40
.25
.10
AVAILABILITY FISH PER ROD-HOUR
X May
X Oct.
XJune
X Sept.
XJuly
X Aug.
40
44
48
52
56
60
64
68
AIR TEMPERATURE °F

TABLE I - WEEKLY CATCH DATA OF NAMELESS LAKE
RAINBOW TROUT WITH MONTHLY TOTALS

WEEK OF:	FISH		ANGLERS		HOURS	
	Monthly Total	Weekly Total	Monthly Total	Weekly Total	Monthly Total	Weekly Total
May 1		14		4		10
8		32		14		25.5
15		34		11		34
22		104		24		91.5
29	316	132	89	36	300	139
June 5		137		38		202
12		105		42		180
19		72		47		195
26	346	32	165	38	703	126
July 3		110		44		215
10		56		35		151
17		24		19		76
24		14		22		90
31	221	27	137	17	589	57
Aug. 7		45		38		188
14		20		16		77
21		18		21		90
28	124	41	99	23	465	110
Sept. 4		36		23		91
11		32		9		48
18		62		30		132
25	186	56	110	28	445	174
Oct. 2		30		8		46
9		22		7		40
16		4		4		12
23		25		10		40
30	109	28	39	9	199	61
TOTAL:	1,302		637		2,701	

TABLE II - MEAN AIR TEMPERATURE DATA, CATCH PER ROD-HOUR AND CATCH PER ANGLER. (APRIL TEMPERATURES INCLUDED TO PROVIDE FOR LAG BETWEEN AIR AND WATER TEMPERATURES)

MONTH OF:	AIR TEMPERATURE °F		FISH PER ROD-HOUR		FISH PER ANGLER	
	Monthly Mean	Weekly Mean	Monthly Total	Weekly Total	Monthly Total	Weekly Total
April 17		40.3				
24		41.4				
May 1		47.1		1.40		3.50
8		44.0		1.26		2.29
15	46.0	57.3		1.00		3.09
22		58.0		1.14		4.33
25		57.9	1.05	.95	3.55	3.67
June 5		55.0		.68		3.61
12	57.5	58.9		.58		2.50
19		55.7		.37		1.53
26		60.9	.49	.25	2.09	.84
July 5		60.9		.51		2.50
10		65.7		.37		1.60
17	61.3	63.3		.32		1.26
24		65.9		.16		.64
31		65.1	.38	.47	1.61	1.59
Aug. 7		64.3		.24		1.18
14	64.9	64.1		.26		1.20
21		64.9		.20		.86
28		65.4	.22	.37	1.27	1.78
Sept. 4		66.6		.40		1.57
11	62.8	54.1		.67		3.56
18		56.6		.47		2.07
25		51.9	.42	.32	1.69	2.00
Oct. 2		50.9		.65		3.75
9		54.3		.55		3.14
16	51.4	43.4		.33		1.00
23		42.7		.63		2.50
30		43.7	.55	.46	2.87	3.11
TOTAL:			.48		2.04	

CREEL CENSUS IN ESKER LAKES PROVINCIAL PARK, 1961 and 1962*

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Abstract

A review of management plans for Park waters is presented. Fishing pressure on Panagapka was 81.1 and 65.2 hrs./acre in 1961 and 1962, respectively. Sixty-nine to 91% of the fishing pressure is exerted April through June. Fishing pressure on Mall Lake was 30.7 and 38.5 hrs./acre in 1961 and 1962, respectively, a marked increase over previous years.

The numbers of fish harvested from Panagapka and the effort required in 1961 and 1962 were as follows: 841 (4.1 hrs./fish); 2582 (1.1). Comparable statistics for Mall are 194 (4.0); 479 (2.0).

Estimates of the recovery rate of adult Brook Trout during the year in which they were planted were 16% (1961) and 22% (1962). Recovery rates for populations bolstered by fall plantings were 38% (1961) and 35% (1962).

Production in terms of pounds of fish harvested per acre for Panagapka were 13.1 (1961) and 42.8 (1962). The greatest return in pounds of production from pounds of fish stocked occurred in years succeeding fall plantings: 79.9% (1960) and 109.2% (1962). Production for Mall, which is planted annually with yearlings, was 6.9 (1961) and 35.0 (1962) pounds per acre.

Introduction

Thirteen lakes within Esker Lakes Park are under management. Creel census data have been collected at the Park gate since 1959 with the purpose of measuring fishing pressure and production. This report summarizes data obtained in 1961 and 1962.

In brief, the following management programs have been carried out. Panagapka, Pall, Mall, Roach, Ramey, Lallan and Bea have been planted annually with Brook Trout. Panagapka is essentially a put-and-take fishery.

* Swastika District Fish Management Project #4.

Campbell Lake was stocked with 81 adult Smallmouth Bass in 1959.

Lulu Lake was planted with Lake Trout in 1959 and 1961.

Seahorse Lake was stocked with Aurora Trout in 1959 and 1960.

Old Man Lake was planted with Rainbow Trout in 1959 and 1960.

Gaf Lake was reclained in 1960 and is presently devoid of fish.

Results

Campbell Lake was checked in the spring of 1961 and there were no bass seen on likely spawning areas. However, further checks are necessary. It is believed that the introductions of Rainbow Trout were unsuccessful. Gaf Lake has detoxified and we plan on using it for an experimental albino Brook Trout fishery.

In 1959 (Patrick, 1959), a significant amount of creel data was obtained for Panagapka, but relatively few anglers fish Mall, Ramey and Lallan, and none of the other trout lakes were fished.

In 1960 (Charlton, 1960), the Park road was closed to vehicles; consequently only Panagapka and Lallan were accessible by auto. Few, if any, anglers portaged to the lakes.

Trout plantings in Park waters in 1961 and 1962 are summarized in Table I. In 1961, all Brook Trout lakes (except Panagapka) were planted in the fall and the fishery depended on stock planted in 1960 or earlier. In 1962, the lakes were planted in the spring.

Fishing Pressure

Fishing pressure in hours of angling per acre is shown in Tables 2 and 3. In 1961, fishing pressure in Panagapka averaged 81.1 hours per acre as compared with 35 in 1960 (Charlton) and 60 in 1959 (Patrick).

Angling pressure on the six other Brook Trout lakes ranged between 0.3 and 30.7 hours per acre. Few anglers tried for Aurora Trout in Seahorse Lake with only 2.1 hours per acre reported.

A similar picture obtains for 1962 (Table 3). Fishing pressure declined in Panagapka (65.2 hrs./ acre), increased in Mall Lake (38.5 hrs./acre) and dropped off in Pall Lake (3.0 hrs./acre).

The temporal distribution of fishing pressure in Panagapka shows the same pattern every year, namely high in April, May and June, and low for the remainder of the summer. The first 64 days of the season accounted for 69.1 per cent and 91.2 per cent of the fishing pressure in 1961 and 1962, respectively. The relatively high fishing pressure in 1961 resulted from the July and August plantings that year. Local anglers seldom fail to take advantage of the easy catches to be made on opening days, and after fish are planted.

Fishing Success

The number of fish harvested and the effort required (hours of angling/fish) are shown in Tables 2 and 3. The total harvest of trout species from Park waters are as follows: 1959 (1,050); 1960 (2,285); 1961 (1,360); 1962 (3,134).

Panagapka:

In 1961 (Table 2), 841 Brook Trout were creeled with an average effort of 4.1 hours of angling required. This time ranged between 5.6 and 14.7 hours in the April through June period. As the result of stocking in July and August, the time improved to a range of one to 3.8 hours, July through September.

In 1962 (Table 3), 2582 Brook Trout were taken and 1790 of these were taken in the first two days of the season. The average effort required was 1.1 hours of angling per fish. The spectacular success during the April to June period (0.8 to 2.0 hrs./fish) can be attributed to the heavy planting made in the previous fall and in June.

Other Lakes:

Statistics in Tables 2 and 3 show that fishing was better in 1962 than 1961 for most lakes, but that most were grossly underfished. In 1961, Mall and Mill Lakes were lightly fished, producing 137 fish (2.1 hrs./fish) and 194 fish (4.0 hrs./fish), respectively. In 1962, few anglers fished Mall, but 479 trout were taken in Mall with an effort of 2.0 hrs./fish required. Few anglers tried for Aurora Trout in Seahorse Lake. It is interesting to note that the Lulu Lake Trout entered the fishery in 1962.

Recovery of Stocked Fish

Panagapka:

Panagapka was stocked with 6,000 two-to four-year-old Brook Trout in the period 14 September, 1959, to 6 July, 1960. In 1960, 2285 (38%) were taken and in 1961, an additional 361 were caught, representing a total recovery rate of 44 per cent.

3,000 two-to five-year-olds were planted between 7 July and 31 August, 1961. Assuming that most of the 480 fish caught in 1961 after 7 July belonged to this group, the recovery rate was 16 per cent.

3,700 five-year-olds were planted in October, 1961, and when combined with the balance from summer plantings, would leave a standing crop of about 6,220 to over-winter. A catch of 2,146 in April and May of 1962 represented a recovery of 35 per cent. 2,000 two-year-olds were planted on 1 June, 1962. Assuming that most of the fish subsequently caught were of this group, the recovery rate was 22 per cent.

The accuracy of estimates of returns is affected by two variables: (a) the contribution of survivors of earlier plantings which would tend to make the estimates high; (b) losses because of natural mortality which tend to make the estimates low. The latter would have its greatest influence in the case of over-wintering populations.

Production

Harvest in terms of pounds of fish per acre and its relation to stocking rate, fishing pressure and fishing success was determined for Panagapka and Mall Lakes. in 1962, fish creeled were measured only. Weights were estimated for Panagapka from size-weight curves based on 1961 data. Weights for Mall Lake were estimated from size-weight curves based on fish collected from test nets in August, 1962.

Data for Panagapka (Table 4) show that the harvest ranged between 8.2 and 42.8 pounds per acre over a four year period (1959-1962). The greatest return in pounds of fish in relation to pounds planted were made in 1960 (79.9%)and 1962 (109.2%), in years succeeding fall planting. The data suggest that fall planting of adults in a put-and-take fishery may be a good management procedure. However, the validity of this conclusion is obscured by the variability in fishing pressure and the numbers of fish planted.

Comparable statistics are given for Mall Lake in Table 5. This fishery is supported by annual plantings of yearling stock. The harvest ranged from 0 to 35 pounds per acre over a four year period. Fishing success has improved in the last two years resulting in a corresponding increase in harvest. As in the case of Panagapka, improved angling may be related to fall planting.

Accuracy of Creel Data

Creel census is obtained on a voluntary basis. Persons entering the Park are asked to report their fishing activities upon leaving.

Counts of the number of anglers fishing Panagapka as compared with the creel census obtained are summarized in Table 6. The counts in July, 1961, were estimates based on spot checks. The counts in August, 1961, are accurate and were obtained by dawn to dusk observations of the number of anglers on the lake.

During five days in July, a total of 46 angler-days of effort was estimated while 34 (74%) were reported. During four days in August, a total of 114 angler-days of effort was observed, while only 13 (11%) were reported.

The decline in the incidents of angler reports in August as compared with July, we believe reflects a decline of interest in fishing in general at this time. We suspect that many of the August fishermen are primarily interested in camping and that their fishing success would be low. Others doubtlessly catch fish for a feed, and since they do not have any when they leave the Park, probably feel that it is unnecessary to make a report.

Nevertheless, it is apparent that our estimates of fishing pressure and harvest are low. This does not detract from the value of the data when used for annual comparisons.

Summary and Conclusions

(1) Attempts to establish Rainbow Trout in the Park appear to have failed.

(2) Lake Trout planted in Lulu Lake in 1959 entered the fishery in 1962.

(3) Little interest has been shown in fishing for Aurora Trout in Seahorse Lake.

(4) Fishing success was excellent in 1962 with between one-half and one-third the effort required to land a fish as compared with 1961.

(5) Estimates of recovery rates of two-year-old or older fish planted on a put-and-take basis were 16% and 22% for summer planted fish in the same year and 35% and 38% for fall planted fish in the succeeding year.

(6) Production in terms of pounds of fish per acre for two lakes ranged between 13.1 and 42.8 for two lakes.

(7) Evidence suggests that the fall planting of two-year-old trout is good management for a put-and-take fishery.

(8) Creel census data for the Park are incomplete resulting in an under-estimate of harvest, fishing pressure and effort (fishing success).

Recommendations

(1) In view of the low fishing pressure, plant Roach, Ramey, Pall, and Bea Lakes with yearling Brook Trout on a three year frequency cycle (1965, 1968, etc.)

(2) Continue to plant Mall Lake at the current annual rate.

(3) Plant Panagapka each year early in June and again after the close of the season in September.

(4) Continue creel census, measuring all fish checked.

Collect scale samples with complete data for the following: 20 per cent of fish caught in Panagapka; 50 per cent of fish taken from Mall; all trout taken from Lulu and Seahorse. This will enable us to make accurate estimates of the rate of return of stocked fish.

Acknowledgments

We wish to express our thanks to the Park Staff, and to R. Ross for their assistance in collecting creel census data.

References

Charlton, W. B. 1960. Fish Management Project #4, 1960 Fish Plantings and Creel Census for Esker Lakes Park. (unpublished report). 4 pp.

Patrick, N. D. 1959. Fish Management Project #4, 1959 Creel Census for Esker Lakes Park. (unpublished report). 3 pp.

TABLE I

BROOK & LAKE TROUT PLANTED IN PARK WATERS IN 1961 AND 1962

	1961				1962			
LAKE	DATE	NUMBER		WEIGHT (LBS.)	DATE	NUMBER		WEIGHT (LBS.)
Roach (B.T.)	Sept. 25	800	Y	44.0	May 17	800	Y	14.3
Ramey (B.T.)	Sept. 25	2,700	Y	147.5	May 17	2,700	Y	48.5
Pall (B.T.)	Sept. 25	700	Y	38.5	May 17	700	Y	12.5
Mall (B.T.)	Sept. 25	1,500	Y	81.8	May 17	1,500	Y	27.0
Lallan (B.T.)	Sept. 25	2,200	Y	120.0	May 16	2,200	Y	39.5
Bea (B.T.)	Sept. 25	900	Y	49.5	May 16	900	Y	16.0
Lulu (L.T.)	May 29	1,250	Y	8.8	--	--		--
Panagapka (B.T.)	July 7	1,000	5Y	447.0	June 1	2,000	2Y	225.0
	Aug. 4	1,000	2Y	180.0				
	Aug. 31	1,000	2Y	220.0	Nov. 20	2,807	Y	196.5
	Oct. 20	1,850	5Y	720.0				
	Oct. 23	1,850	5Y	720.0				

TABLE 2

1961 CREEL CENSUS DATA

Lake	Month and/or Number of Days Fished	Number Angler-Days	Number Man-Hours	Number Fish	Weight in Lbs.	Fishing Success hrs./fish	Fishing Pressure hrs./acre
Panagapka (B.T.)	April (2)	184	1218	216	199.81	5.6	28.7
	May (14)	172	750	108	107.97	6.9	17.6
	June (11)	80	411	28	36.50	14.7	9.7
	July (18)	203	621	300	135.10	2.1	14.6
	Aug. (20)	79	331	87	41.81	3.8	7.8
	Sept. (6)	22	109	102	36.69	1.0	2.7
TOTALS	71	740	3440	841	557.88	4.1	81.1
Pall (B.T.)	12	42	289	137	96.25	2.1	26.3
Bea (B.T.)	1	2	4	5	2.75	0.8	0.3
Mall (B.T.)	25	99	768	194	171.63	4.0	30.7
Roach (B.T.)	3	7	26	15	6.94	1.7	2.1
Ramey (B.T.)	8	20	128	31	18.88	4.1	5.7
Lallan (B.T.)	11	50	228	113	64.03	2.0	6.1
Seahorse (A.T.)	4	12	48	24	13.06	2.0	2.1
GRAND TOTALS		970	4931	1360	931.42	3.6	26.5

TABLE 3

1962 CREEL CENSUS DATA

Lake	Month and/or Number of Days Fished	Number Angler-Days	Number Man-Hours	Number Fish	Weight in Lbs.	Fishing Success hrs./fish	Fishing Pressure hrs./acre
Panagapka (B.T.)	April (2)	281	1357	1790	1414.29	0.8	31.9
	May (9)	182	718	356	254.15	2.0	17.0
	June (20)	112	452	403	131.29	1.1	10.6
	July (6)	20	135	13	12.53	10.4	3.2
	Aug. (4)	12	112	16	11.54	7.0	2.3
	Sept. (2)	4	8	4	2.72	2.0	0.2
TOTALS	43	611	2782	2582	1826.52	1.1	65.2
Pall (B.T.)	4	12	33	21	23.31	1.6	3.0
Mall (B.T.)	27	146	962	479	874.22	2.0	38.5
Roach (B.T.)	1	3	15	12	3.78	1.3	1.2
Raney (B.T.)	3	8	36	3	6.90	12.0	1.6
Lallan (B.T.)	3	15	75	21	33.31	3.6	2.0
Seahorse (A.T.)	2	4	7	5	3.33	1.4	0.3
Lulu (L.T.)	2	7	48	11	16.81	4.4	0.4
GRAND TOTALS		806	3958	3134	2788.17	1.3	*21.3

* - Excluding Lulu and including Bea.

TABLE 4

YIELD OF BROOK TROUT FOR PANAGAPKA LAKE

YEAR	1959	1960	1961	1962
Lbs. fish planted/acre	17.8	32.3*	19.9	39.2*
Lbs. fish harvested/acre	8.2	25.8	13.1	42.8
Harvest as % of fish planted	46.1	79.9	65.8	109.2
Fishing pressure (hrs./acre)	60.0	35.0	81.1	65.2
Fishing Success (hrs./fish)	5.2	0.7	4.1	1.1

* - Include fish planted the previous fall after September 15.

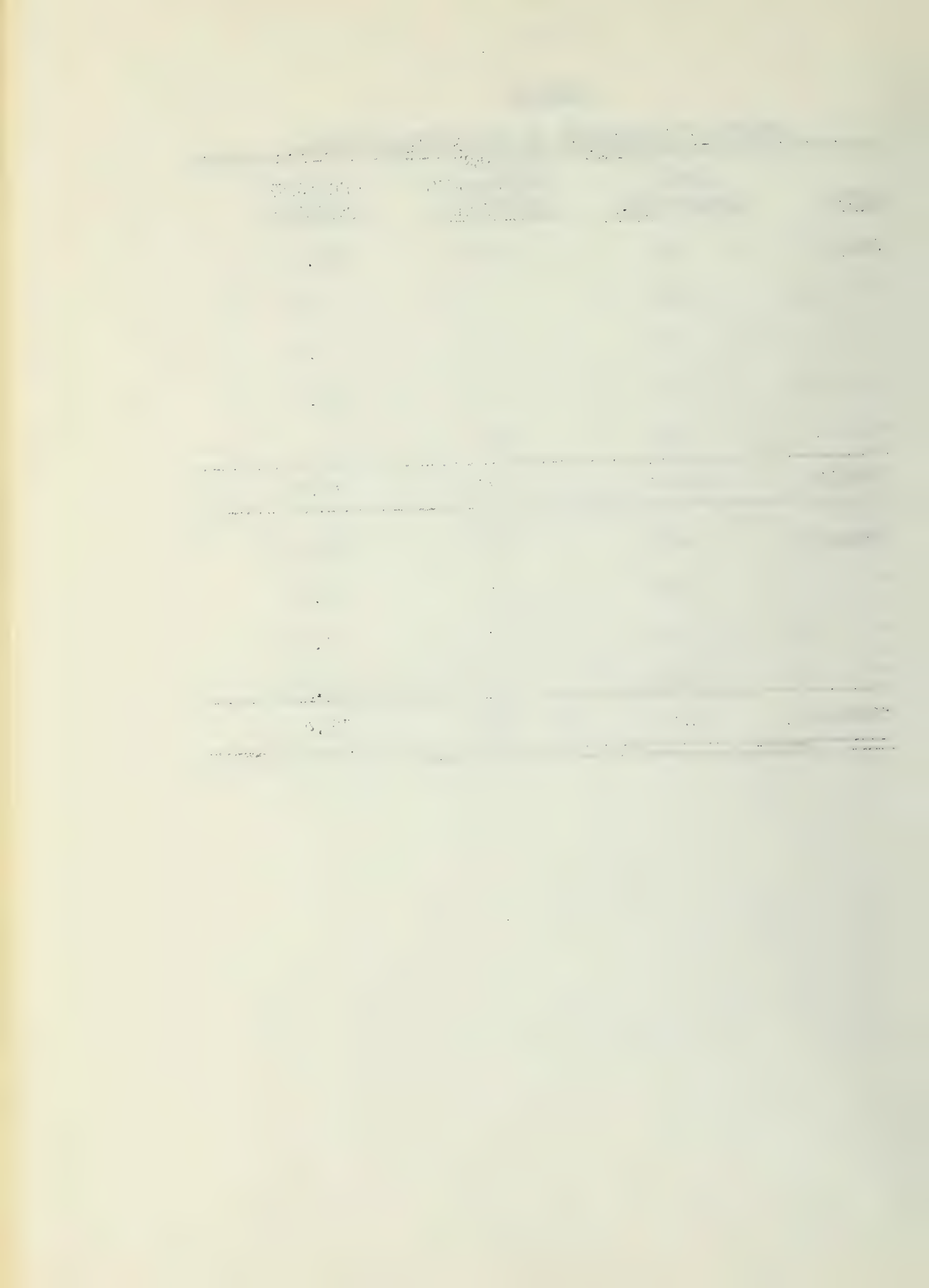
TABLE 5

YIELD OF BROOK TROUT FOR MALL LAKE

YEAR	1959	1960	1961	1962
Lbs. fish planted/acre	2.0	2.4	0.0	4.4*
Lbs. fish harvested/acre	1.4	0.0	6.9	35.0
Harvest as % of fish planted	70.0	0.0	---	709.5
Fishing pressure (hrs./acre)	24.6	0.0	30.7	38.5
Fishing success (hrs./fish)	53.0	---	4.0	2.0

* - Include fish planted the previous fall after September 15.

TABLE 6

COUNTS OF FISHERMEN ON PANAGAPKA IN 1961

DATE	NUMBER ANGLER-DAYS	NUMBER ANGLER-DAYS REPORTED	PER CENT REPORTED
July 1	10	10	100.00
" 2	10	0	0.0
" 3	6	0	0.0
" 8	10	9	90.0
" 9	10	15	--
TOTALS	46	34	73.9
August 4	40	10	25.0
" 5	10	2	20.0
" 6	43	1	2.3
" 7	21	0	0.0
TOTALS	114	13	11.4